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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/019,287	01/02/2002	Yasuyuki Kawahara	011731	1458

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EXAMINER

OH, TAYLOR V

ART UNIT	PAPER NUMBER
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1625

DATE MAILED: 06/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/019,287

Applicant(s)

KAWAHARA ET AL.

Examiner

Taylor Victor Oh

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 04 March 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-88 is/are pending in the application.
- 4a) Of the above claim(s) 1-5, 12-18, and 31-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 6-11, 19-30 and 34-88 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 1/28/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

***Final Rejection***

**The Status of Claims**

Claims 1-88 are pending.

Claims 6-11 ,19-30, and 34-88 have been rejected.

Claims 1-5, 12-18, and 31-33 have been withdrawn.

**Claim Rejections-35 USC 112**

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

The rejection of Claims 6-11 ,19-30, and 34-88 under 35 U.S.C. 112, second paragraph, has been withdrawn due to the modification made in the amendment.

**Claim Rejections - 35 USC § 103**

1. Applicants' argument filed 3/4/05 have been fully considered but they are not persuasive.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**The rejection of Claims 6-11 ,19-30, and 34-88 under 35 U.S.C. 103(a) as being unpatentable over Fukuda et al (U.S. 5,185,092) in view of Satoru et al (JP-07-233385) and Hiroyasu (JP-10-140170) .**

The rejection of Claims 6-11 ,19-30, and 34-88 under 35 U.S.C. 103(a) as being unpatentable over Fukuda et al (U.S. 5,185,092) in view of Satoru et al (JP-07-233385) and Hiroyasu (JP-10-140170) has been maintained for the reasons of the record on 10/7/04.

#### **Applicants' Argument**

2. Applicants argue the following issues:

1. With respect to claims 6-11, Fukuda et al does not disclose the alicyclic dicarboxylic acid ,such as cyclohexanedicarboxylic acid or methylcyclohexanedicarboxylic acid of claim 6 ; Fukuda et al does not disclose the starting monohydric alcohol peroxide value to be below 1.0 meq/kg and the 20 ppm or less sulfur and phosphorus contents in the absence of a catalyst ; Fukuda et al does not teach a step of removing excess starting materials, of neutralizing or washing with water, and a dehydrating step;

2. With respect to claims 6-11, Satoru et al does not disclose the peroxide value of the starting monohydric alcohol ; Satoru does not teach a neutralization of polyvalent carboxylates , nor a step of washing them with water;
3. With respect to claims 6-11, Hiroyasu et al does disclose the formation of a triester by esterifying a monohydric alcohol with an aromatic tribasic acid in the absence of a catalyst , not a diester;
4. With respect to claims 19-30 and 34-88, Fukuda et al does not disclose the formation of the mixed dicarboxylic diesters in the process ; Fukuda et al does not teach that  $R^5$  and  $R^6$  are different from each other ; Fukuda et al does not indicate that the starting monohydric alcohol peroxide value to be below 1.0 meq/kg and the 20 ppm or less sulfur and phosphorus contents in the absence of a catalyst ; Fukuda et al does not teach a step of removing excess starting materials, of neutralizing or washing with water, and a dehydrating step;
5. With respect to claims 19-30 and 34-88, Satoru et al does not disclose that the process can be carried out in the absence of a catalyst ; Satoru does not teach a neutralization of polyvalent carboxylates , nor a step of washing them with water;
6. With respect to claims 19-30 and 34-88, Hiroyasu et al does disclose the formation of a triester by esterifying a monohydric alcohol with an aromatic tribasic acid in the absence of a catalyst , not a diester; Hiroyasu et al does not disclose the formation of the mixed dicarboxylic diesters in the two- step process;

and Hiroyasu et al does not teach a step of removing excess starting materials, of neutralizing or washing with water, and a dehydrating step.

The applicants' argument have been noted, but these arguments are not persuasive.

First, with respect to the first through the sixth arguments, the Examiner has noted applicants' argument. However, Fukuda et al does teach the preparation of the lubricating oil for a refrigerator in which the base oil is a diester of an aliphatic monohydric alcohol and a generic aliphatic dicarboxylic acid (see col. 2, lines 16-27), which includes cyclohexanedicarboxylic acid or methylcyclohexanedicarboxylic acid, or of an aliphatic monohydric alcohol and an aromatic di or -tri carboxylic acid (see col. 3, lines 12-14).; also, it possible to form the mixture of the esters as shown below (see col. 5, lines 16-34):

The mixing ratio of the aliphatic monocarboxylic acid and the aliphatic acid or aromatic dicarboxylic acid, aromatic tricarboxylic acid or aromatic tetracarboxylic acid is preferably 6:1 (mol ratio). In the esterification reaction, the ratio of the total quantity of aliphatic monocarboxylic acid and aliphatic dicarboxylic acid or aromatic dicarboxylic acid to the quantity of aliphatic polyhydric alcohol is preferably 7:1 (mol ratio).

For the esterification reaction, the lubricating oil for a refrigerator of this invention may be prepared through the reaction of a partially esterified substance with an aliphatic monocarboxylic acid after the esterified substance is obtained by the reaction of the polyhydric alcohol with the aliphatic dicarboxylic acid or aromatic dicarboxylic acid in the predetermined ratio, or the order of reaction of the carboxylic acids may be reversed. Or, mixed carboxylic acids may be used for the esterification.

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Thus, there is a teaching of equivalence between the di-ester and tri-ester with respect to forming their corresponding esters by using the prior art process. Furthermore, Fukuda et al has expressly described the details of the peroxide content to be below 1.0 meq./kg in the esterification process as shown below (see col. 6 ,lines 35-65):

Esters can be obtained by the esterification reaction, e.g., by esterification of alcohols and aliphatic carboxylic acid in the presence of an acid catalyst, e.g., phosphoric acid. The esters obtained by such method have a total acid number of 0.1-0.5 mg KOH/g, a peroxide number 0.1-5 meq./kg, an aldehyde number 0.1-5 mg KOH/g, a bromine index 1-100 mg/100 g, an ash content 5-50 ppm, and a moisture content 300-1000 ppm.

Further, to increase the refrigerant stability, it is necessary to reduce the peroxide number, aldehyde number and bromine index to lower values, to reduce the ash content so as to reduce sludge and the like, and to reduce the water content in order to maintain hydrolytic stability and the insulating property.

For this purpose, it is necessary to purify the above esters obtained by the normal esterification reaction and to adjust the above indices for the properties of the ester oil to a range suitable for an oil for a refrigerator. As the result, an excellent oil for refrigerator can be prepared.

It is preferable to purify organic carboxylic acid esters through contact processing with silica gel, activated alumina, activated carbon, zeolite, etc. The

In addition, with respect to the sulfur and phosphorus contents of 20 ppm, the prior art are silent. However, the sulfur and phosphorus contents are commonly used for assessing an ester like the aforementioned properties. In order to obtain esters with certain lubricant properties, the skilled artisan in the art would have been obvious to carry out the sulfur and phosphorous content test so as to verify the criteria for the claimed refrigerator oil composition.

Moreover, the secondary Satoru et al reference does indicate the use of 1,4-cyclohexane carboxylic acid and the monohydric alcohol in the preparation of the refrigerating -machine - oil containing mixed aliphatic esters (see page 4 ,translation , paragraph 0020); it is recommended to use potassium hydroxide or calcium hydroxide (see page 6 ,translation , paragraph 0039) for the neutralization of the carboxylic acid after the esterification; furthermore, with respect to the neutralization of polyvalent carboxylates ,the Satoru et al reference has pointed out that, in order to remove any impurities present in the ester mixture, it is good to perform purification of the ester by using silica gel , activated carbon or ion exchange resin which may imply washing and drying procedures (see page 6 ,translation , paragraph 0040) ; that is a well-known process in the art; therefore this is at least a two-step process.

Also, the tertiary Hiroyasu et al does disclose that it is possible to form a triester by esterifying a monohydric alcohol with an aromatic tribasic acid in the absence of a catalyst.

Fukuda et al expressly teaches the preparation of the lubricating oil for the refrigerator in which the base oil is the diester of an aliphatic monohydric alcohol and an aliphatic dicarboxylic acid or of an aliphatic monohydric alcohol and an aromatic di or -tri carboxylic acid. Satoru et al has also indicated that the mixed aliphatic esters obtained from the reaction of 1,4-cyclohexane carboxylic acid and the monohydric alcohol can be used for the lubricating oil for the refrigerator and the neutralization of the carboxylic acid after the esterification can be helpful for enhancing the purification process. Furthermore, Hiroyasu does teach an equivalency between the aromatic acid or its anhydride with respect to the reactant for the esterification process for making a composition for refrigerator working oils.



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All the prior art are directed to producing the lubricating oil for the refrigerator which contains the ester products. In order to obtain the ester products with certain lubricant properties, it would have been obvious to the skilled artisan in the art to be motivated to have incorporated Hiroyasu's aromatic anhydride as the reactant as an alternative in the absence of catalyst, along with the addition of Satoru's et al neutralization step after the esterification, into Fukuda et al process. This is because the skilled artisan in the art would expect such combinations of the prior art to be successful and effective in the process of obtaining the desired ester products with claimed lubricant properties. Therefore, the prior art rejection over the current invention is deemed to be proper.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

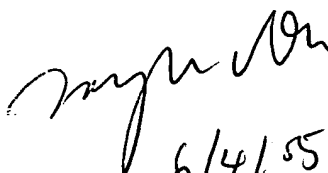
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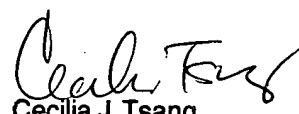
however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Taylor Victor Oh whose telephone number is 571-272-0689. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cecilia Tsang can be reached on 571-272-0562. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
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